An aberrant extra fin in *Zearaja chilensis* (Chondrichthyes: Rajidae)

by

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RÉSUMÉ. - Un cas aberrant de nageoire supplémentaire chez *Zearaja chilensis* (Chondrichthyes: Rajidae).

La présente note décrit un cas aberrant de nageoire supplémentaire chez un spécimen de *Zearaja chilensis* (Guichenot, 1848), capturé au large de la Patagonie dans les eaux argentines.

Key words. - Rajidae - Batoids - *Zearaja chilensis* - Argentina - Deformity - Supplementary appendage.

The yellownose skate *Zearaja chilensis* (Guichenot, 1848) is endemic to southern South America and is widely distributed over the Argentinean continental shelf (Cousseau *et al*., 2007).

Several morphological abnormalities have been recorded in batoids, with the principal deformity being the lack of fusion of pectoral fins to the head (Templeman, 1965); abnormal dentition (Gudger, 1933); deformities in the axial skeleton (Templeman, 1965); dicephalia (Bornatowski and Abilhoa, 2008); and supplementary appendages (Bureau, 1890; Ben Brahim and Capapé, 1997; Nunes and Piorski, 2009). This paper reports the first occurrence of a supplementary appendage in *Zearaja chilensis*.

MATERIALS AND METHODS

The specimen was collected in February 2005 by the R/V *Dr. Eduardo Holmberg*, of the Instituto Nacional de Investigación y Desarrollo Pesquero (INIDEP), at 47°00'S, 63°36'W and 108 m depth (off Patagonian waters, Argentina). The specimen was preserved in 10% formalin and catalogued in the INIDEP fish collection, as INIDEP 816. Morphometric measurements were taken to the nearest 0.1 mm and are given in table I. The specimen was ventrally radiographed and partially dissected to reveal the internal structure of the appendage. Since the specimen is unique, the dissection was carefully made and the supplementary appendage was not removed.

Table I. - Morphometric measurements (mm) of the specimen of *Zearaja chilensis* with an aberrant extra fin.

Measurements (mm)	
Total length	655
Disc width	508
Disc length	431
Supplementary fin base length	39
Supplementary fin height	119
Distance snout to supplementary fin origin	217
Length of supplementary fin anterior margin	126
Length of supplementary fin total posterior margin	93
Length of supplementary fin inferior lobe	31
Length of supplementary fin inferior margin	61

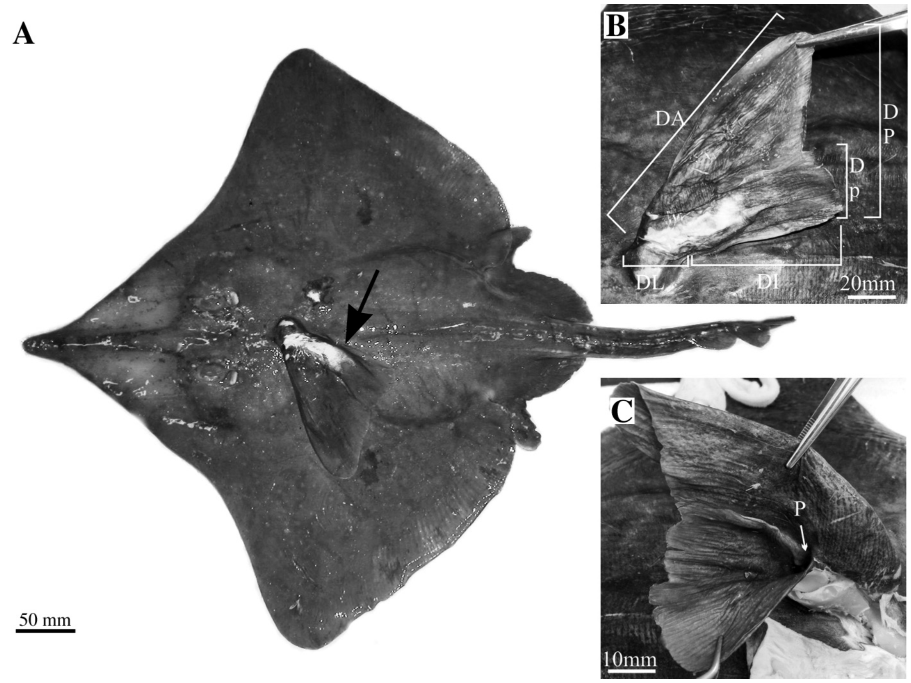

Figure 1. - Specimen of *Zearaja chilensis* with a supplementary appendage. **A**: Dorsal view of the whole body (the arrows points to the extra fin); **B**: Lateral (left) view of the extra pectoral fin (EPF) with measurements; **C**: Lateral (right) view of the EPF showing the pocket. DA: anterior margin; DI: inferior margin; DL: base length; Dp: inferior lobe posterior margin; DP: total posterior margin; P: pocket.

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RESULTS

The abnormal specimen is a juvenile female (655 mm total length and 508 mm disc width) with a supplementary appendage on the dorsal surface of the disc, near the posterior base of the cranium (Fig. 1A). Externally this appendage is uniformly brown with a lighter base on the right side and possesses some scattered spines. The appendage is triangular shaped, joined to the midline and lays over medial half of the left side of the disc. The base is narrow and expands distally with the anterior margin longer than the posterior margin (Fig. 1B). The latter has two lobes, being the inferior one smaller than the superior (Fig. 1B). The left side of the inferior lobe is folded and forms a pocket (Fig. 1C).

The X-ray images (Fig. 2A, 2B) reveal an unusual cartilaginous structure above the anterior portion of the cervicothoracic synarcual, absent in normal specimens (Fig. 2C). This structure is triangular in shape and has two foramina near the left corner (Fig. 2B).

In order to corroborate the observations from the X-radiograph, a dissection from the base toward the superior end of the abnormal structure was done (Fig. 3). A cartilaginous structure located on the anterior portion of the cervicothoracic synarcual was observed (Fig. 3A). Dorsally a foramen could be observed (Fig. 3B), but those that can be seen in the X-radiograph were ventral. The left margin of the structure articulates with the basal part of the fin which has two lobes (Fig. 3A). The inferior lobe is constituted by fused radials and the superior by differentiated radials (Fig. 3A).

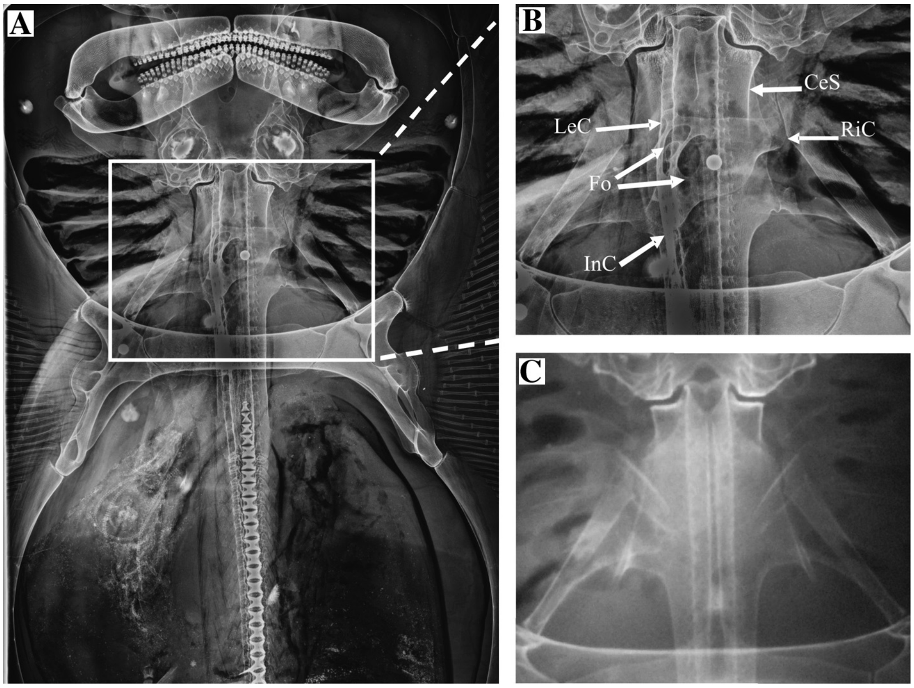

Figure 2. - X-radiographs of *Zearaja chilensis* in ventral view. **A**: Specimen showing the abnormality; **B**: Detail of the unusual cartilaginous structure; **C**: Normal specimen. CeS: cervicothoracic synarcual; Fo: foramina; InC: inferior corner; LeC: left corner; RiC: right corner.

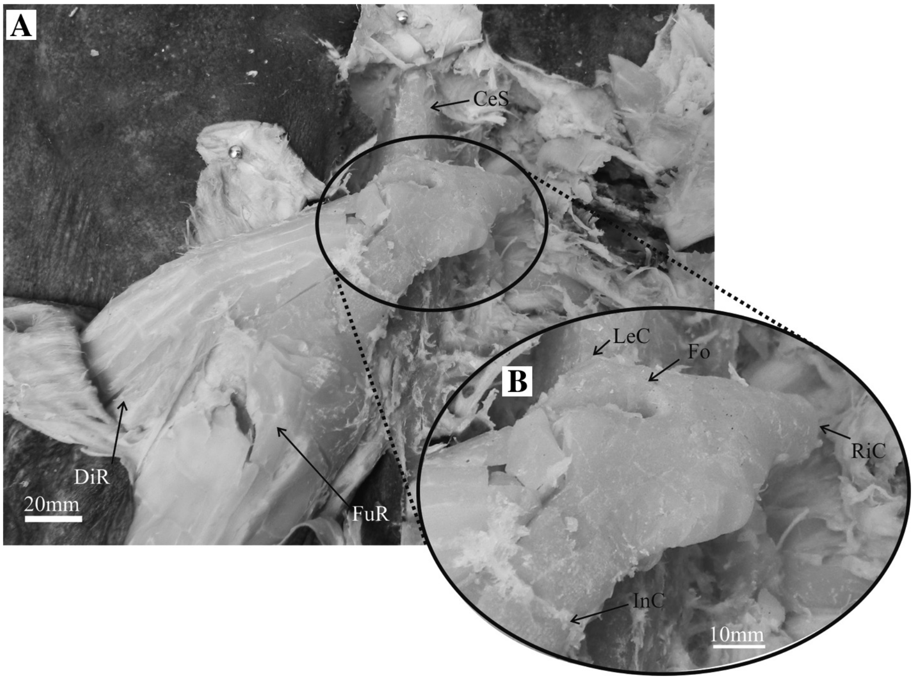

Figure 3. - Internal structure of the supplementary appendage in dorsal view, after a partial dissection. **A**: Entire appendage; **B**: Enlarged view of the appendage base. CeS: cervicothoracic synarcual; DiR: differenciated radials; Fo: foramina; FuR: fused radials; InC: inferior corner; LeC: left corner; RiC: right corner.

DISCUSSION

The appendage described here exhibits a similar morphology to part of a pair fin (e.g., rigid cartilaginous base with radials). The insertion of this structure near the synarcual and the presence of relatively large foramina that resembles an irregular scapulocoracoid, suggest this appendage could be an aberrant pectoral fin.

Few cases of Chondrichthyes with additional appendages have been reported in the literature. The only case registered in skates is mentioned in Bureau (1890) who wrote “De Lacepède a donné le nom de Raie Cuvier à une Raie qui porte une nageoire dorsale sur le milieu du disque”, but unfortunately the structure was not described. An extra fin was reported by Quéro (1978), who found a pelvic fin placed on the head of a specimen of *Squalus acanthias* L., 1785. The external morphology of the structure was described and the presence of finger like appendages that resemble claspers led Quéro (1978) to suggest that it was a pelvic fin. Ben Brahim and Capapé (1997) reported a *Torpedo torpedo* (L., 1758) from the Tunisian region of the Mediterranean Sea with a supplementary dorsal fin on the disc. Nunes and Piorski (2009) also found a dorsal fold located on the tail of two specimens of *Gymnura micrura* (Bloch and Scheneider, 1801), caught in the Maranhão State (Brazil). The reported structures were adipose and lacked any supporting rays. Conversely, the fin described here has all the supporting elements of a true pectoral fin.

The cause of morphological deformities in fishes remains uncertain. Conditions such as parasitic infection, arthritis, injury, tumors, poor nutrition, or a congenital abnormality have all been suggested as causal factors (Heupel *et al*., 1999). Unfavorable environmental conditions during embryonic development may also be a factor determinant of morphological deformities (Mancini *et al*., 2006).

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